

UNITED STATES MARINE CORPS
Basic Officer Course
The Basic School
Marine Corps Combat Development Command
Quantico, Virginia 22134-5019

B2107

INTRODUCTION TO WEAPONS EMPLOYMENT**Student Handout**

INTRODUCTION. When Marines have completed individual marksmanship training, and before they commence combat firing in tactical situations, they must understand the capabilities and limitations of their weapon systems. They must also learn the techniques of rifle, automatic weapon, and grenade launcher fire. Techniques of fire refers to the application and control of the combined fire of a unit. This class will focus on units of fire team and squad size.

1. Characteristics of Fire

a. **Trajectory**. Trajectory is defined as the path of the bullet as it moves through the air. Due to the muzzle velocity of the rifle, the trajectory as the bullet leaves the weapon is very flat. As the bullet loses its velocity at greater ranges, the trajectory begins to fall sharply. When engaging a target at 100m the trajectory is going to be quite flat and close to the ground, whereas at 1000 meters, there is considerably more curve to the trajectory and it rises quite a distance above the ground.

b. **Cone of fire**. Each bullet fired from the rifle follows a slightly different trajectory due to small ballistic changes in different rounds of ammunition, and the human error of the person firing the weapon. The pattern formed by these varying trajectories in the air is known as the cone of fire.

c. **Beaten zone**. The beaten zone is the area on the ground in which the bullets within the cone of fire strike (see Figure 1). At short ranges the beaten zone will be long because of the initial trajectory, and narrow because of the relatively short distance the bullet travels before it strikes the ground. As the range increases, the beaten zone will decrease in length because the bullets will be falling at a steeper angle, and increase in width as the rotation of the bullet further affects the dispersion. The slope of the trajectory will cause the beaten zone to be shorter. Ground which slopes downward with the trajectory will cause the beaten zone to be longer.

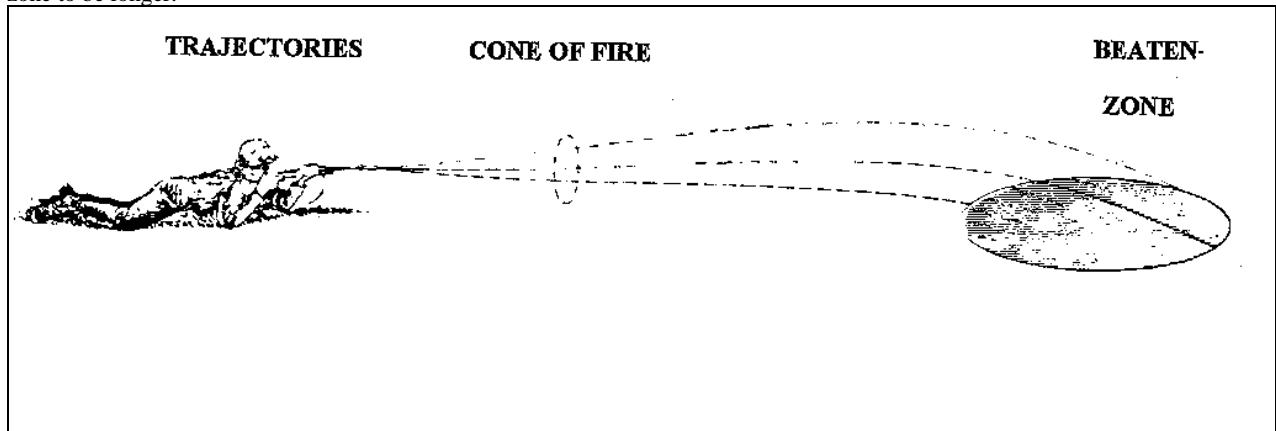


Figure 1

d. Danger space. Danger space is the space between the rifle and the target in which the trajectory does not rise above the height of the average standing man (1.8m). A bullet fired from the rifle from the prone position at a range of 600 meters will not rise over 68 inches from the ground, providing the ground is uniformly sloping or level for that 600 meters. Therefore, we have continuous danger space over level or uniformly sloping ground up to a range of 600 meters. At ranges greater than 600 meters, we have danger space for varying distances from the muzzle and from the target. At different ranges there will be a portion of the trajectory that rises above the height of the average man and there will be no danger space in that particular area. When this occurs we have what is called "dead space." Dead space - an area within the maximum effective range of a weapon that cannot be covered by fire from a given position because of intervening obstacles, the nature of the ground, the characteristics of the trajectory, or the limitations of the pointing capabilities of the system. (FM 101-5-1) When standing in the dead space an average man will not be struck by a passing round. (See Figure 2.)

Figure 2

2. **Classes of Fire**

a. With respect to the target

- (1) Frontal fire is fire delivered to the front of an enemy unit whether it is in column or deployed as skirmishers.
- (2) Flanking fire is fire delivered on the flank of an enemy unit whether it is in column or deployed as skirmishers.
- (3) Oblique fire is fire delivered in such a manner that the long axis of the beaten zone strikes the long axis of the target obliquely without regard to the direction of the enemy's front.
- (4) Enfilade fire is fire delivered in such a manner that the long axis of the beaten zone coincides, or nearly coincides, with the long axis of the target. Enfilade fire is the most desirable type of fire with respect to the target because there is a greater change of causing casualties along the long axis of the beaten zone.

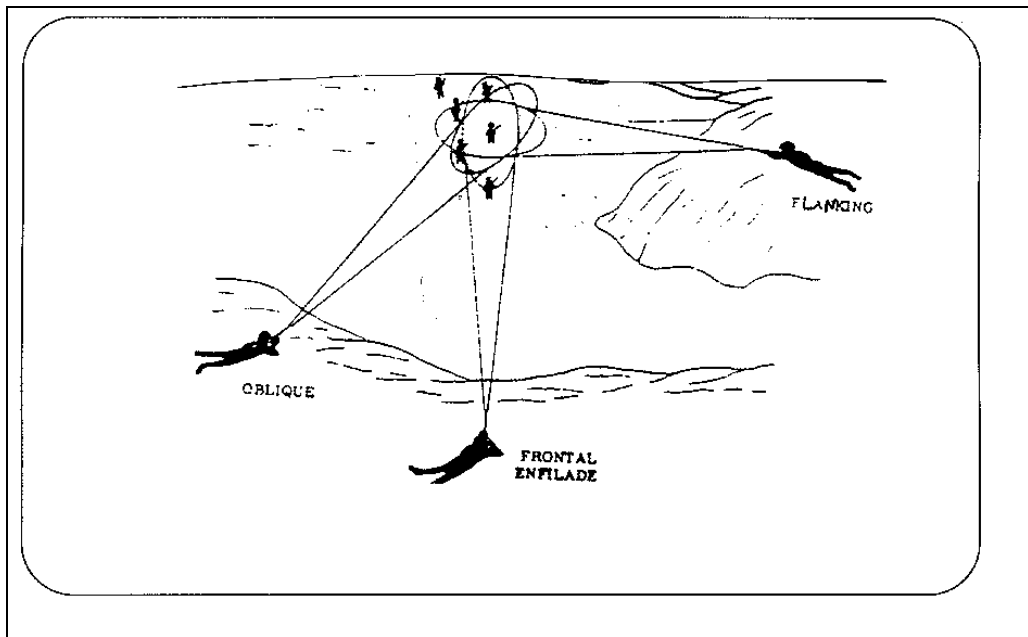


Figure 3

b. With respect to the ground

(1) Grazing fire is that in which the center of the cone of fire does not rise above one meter from the ground. Over level or uniformly sloping terrain, the rifle will deliver grazing fire to a range of 550 meters.

(2) Plunging fire is fire in which the bullets strike the ground from a high angle so that the danger space is practically confined to the beaten zone, and the length of the beaten zone is materially shortened. Fire at longer ranges becomes increasingly plunging because the angle at which the bullets strike the ground is steeper (see Figure 4).

Figure 4. Plunging fire

(3) Overhead fire is any of the above classes of fire which are delivered over the heads of friendly troops. It is considered safe when the ground offers protection to the friendly troops, or if they are a sufficient distance below the line of fire. Its use in any case depends on necessity and sound judgement.

3. **Fire Control.** It is simply the initiation and supervision of the fire of the unit by its leader. And how does he do it? BY ISSUING AN APPROPRIATE FIRE COMMAND WHEN HIS MARINES MUST ENGAGE THE ENEMY. The acronym "ADDRAC" (Alert, Direction, Description, Range, target Assignment and fire Control) is used to initiate and control fires.

4. **Fire Commands.** The following are the elements of the fire command:

a. Alert. The alert is simply a method of letting your unit know that there is a target to be engaged. Let's assume that we are working with a T/O rifle squad. The alert would consist of one word, "Squad". If you, as a squad leader, desire to alert only part of your unit, you might say, "Third Team"; "Jones and Smith." Normally though, you will want to alert your entire unit even if the target appears to be a small one. Should the target turn out to be bigger than you first estimated, you could bring the fire of your other Marines to bear without repeating the fire command. A technique to quickly alert your unit would be to give the "squad" hand and arm signal.

b. Direction. Direction may be indicated in the following ways:

(1) Orally. The surrounding terrain is divided into eight sections as indicated on the chart (see Figure 5). All the squad leader has to say then is right front, front, left flank, or rear. When possible, cardinal directions should be given to alleviate possible confusion between unit members.

Figure 5

(2) Pointing. Pointing with the arm or a weapon is used as a method of indicating direction when it is impossible to give direction orally, or when it is necessary to retain the element of surprise.

(3) Use of a reference point. Most of the time there is not time to indicate clearly by pointing, and it is not desirable to give away the element of surprise by using tracer fire. If these conditions exist, and the target cannot be adequately indicated by saying, front, left flank, rear, we must amplify the oral method of indicating direction by use of a reference point. The unit leader's fire command in this instance would simply be "front, reference lone tree." This method is satisfactory as long as the target is on the line between the reference point and the observers. However, we need a method of measuring right and left from a reference point to a target that might not be on this line. The observer may use his hand and fingers for angular deviation where speed is essential. The observer fully extends his arm with the palm of his hand pointed toward the reference point. Using his fingers for angular deviation he indicates the target's location. An example would be "front, reference lone pine tree, two fingers right."

c. Target description. The third element of fire is the description of the target. Normally, during a fire fight the battle conditions make the possibility of confusion and strain greater. Therefore, it is necessary, in order to avert further or greater confusion, to keep the target description as brief and as accurate as possible. For instance, it is never necessary to use the word "enemy" in describing a target. It is assumed. If a target is a mortar, don't say, "enemy 81mm mortar," simply, say, "mortar." The use of any type of adjective in the description of a target is seldom, if ever, necessary.

d. Range. Range is the fourth element of the fire command. There are two methods of indicating the range to a target:

(1) Orally. Range may be expressed orally. In order to lessen any chance of being misunderstood, ranges of 100, 200, 300, meters, etc., are given as "one hundred; two hundred; or three hundred." Ranges other than these are given number by number, (i.e., one two five, two five zero, or three seven five).

(2) Hand and arm signals. In the event silence is necessary, or that the firing unit leader cannot make himself heard, range may be given by hand and arm signal. The hand and arm signal used to indicate range is simple; the balled fist extended at arms length, with the appropriate numbers of fingers raised to indicate the meters. One finger indicates one hundred meters; two fingers, two hundred.

e. Target assignment. The assignment element tells who is to fire on the target. In many cases it is not desirable that the entire unit engage the target. Therefore, specific individuals or subordinate units must be assigned. If you desire one fire team only to fire, the command would be, "First team." In the case of a rifle squad, you have already given the command, "Squad," in the alert. Assuming that you want the whole squad to fire it is not necessary that you repeat the command, "Squad," in the assignment element. The men of the squad know that they are all to fire when this element is omitted.

f. Fire control. The fire control element consists of a command or signal to open fire.

(1) In the event the leader desires immediate fire on the target and if the element of surprise is of little

importance, he will command, "Commence firing," immediately after assigning the target.

(2) In the event that the leader wants his initial volume of fire to be as great as possible and to retain the element of surprise, his command would be "On my command" or "At my signal." After he has ensured that all members of his unit are ready to fire, he then gives the command, "Commence firing."

(3) In some cases it is desirable to control the number of rounds to be fired by the men of the unit. In this case, the leader can prescribe the number of rounds or magazines to be fired by the riflemen and the AR men. For instance; "Riflemen, two magazines; AR Men, one drum."

(4) There are arm and hand signals used in the fire control element also. Usually the noise of a fire fight is of such proportion that the leader has a very difficult time making himself heard, much less understood. In these cases, the use of hand and arm signals is of great importance. The signals are:

(a) Commence firing. Extend arm forward, waist high, palm downward and move it through a wide horizontal arc several times.

(b) Fire slower. Extend arm and hand as in commence firing, but move it through the horizontal arc in a slower motion.

(c) Fire faster. Extend arm and hand as in commence firing but move it through the horizontal arc with a much faster motion.

(d) Cease fire. Raise forearm in front of face, palm outward and swing it up and down several times in front of face.

(5) Examples of fire commands

(a) Point target to the front

1 _____ SQUAD (OR FIRE TEAM)

2 _____ FRONT

3 _____ MACHINE GUN

4 _____ THREE HUNDRED

5 _____ COMMENCE FIRING

Notice that the target assignment was omitted. The unit leader wants the entire squad to fire on the target. Also notice that he did not desire surprise fire in as much as he gave the order to commence firing immediately.

(b) Linear target to the left front

1 _____ SQUAD

2 _____ LEFT FRONT, REFERENCE: LONE PINE TREE

3 _____ TROOPS ON LINE EXTENDING TWO FINGERS RIGHT

4 _____ TWO FIVE ZERO

5 _____ AT MY SIGNAL _____ COMMENCE FIRING

In this example, a reference was used in describing the target, along with finger measurements. Again the target assignment element was omitted because the entire squad was to engage the target. Also, the command to commence fire was preceded by the command "at my signal" because surprise fire was desired. Naturally, an appropriate interval is given between the two commands to allow the men to prepare to open fire as accurately as possible.

(c) Point target to the right front

1 _____ SQUAD

FINGERS LEFT

2 _____ RIGHT FRONT, REFERENCE: LARGE WHITE BOULDER, THREE

3 _____ ROCKET POSITION

4 _____ ONE FIVE ZERO

5 _____ SECOND TEAM

6 _____ COMMENCE FIRING

Here the reference point and finger measurements were used in the direction element of the fire command to pinpoint the target. In this case the target assignment element was included in as much as the leader decided that he wanted his second fire team to fire on the target.

5. **Rates of Fire.** The rates of squad weapons combine to form the firepower of the squad. Weapons employment and squad firepower is not determined by how fast Marines can fire their weapons but how fast they can fire accurately. The squad or fire team leader must be able to control the rate and effect of his men's fire, otherwise, ammunition is wasted. The rate of fire for weapons is expressed in rounds per minute (RPM). The following rates of fire apply to the weapons of the rifle squad.

a. Average rate. This refers to the average rate of aimed fire a Marine can deliver with semiautomatic rifle or with an M203 grenade launcher. The following average rates apply to squad weapons:

(1) M-16: 10 to 12 RPM

(2) M203: 5 to 7 RPM

b. Sustained rate. This term applies to rifles, automatic weapons, and machine guns. It is the actual rate of well-directed fire a weapon can deliver for an indefinite length of time without causing a stoppage or malfunction due to overheating. The sustained rate for the SAW is 85 RPM. The sustained rate for the M16A2 is 12 to 15 RPM.

c. Rapid rate. This term applies to automatic weapons and machine guns. It is the maximum amount of controlled fire which can be delivered on target for a short period of time (usually not more than two minutes) without causing a stoppage or malfunction due to overheating. The rapid rate for the SAW is 200 RPM.

6. **Types of Unit Fire**

a. General

(1) The size and nature of a target may call for the firepower of the entire unit or only parts of it. The type of target suggests the type of unit fire to be employed against it. The squad leader receives his orders from the platoon commander who may establish engagement criteria and target precedence (refer to B0326, *Combat Orders I*). It is usually desirable for each squad to cover a portion of the platoon frontage that overlaps with adjacent squads.

(2) A fire team distributes its fire as designated by the squad leader. Normally, the squad leader orders a fire team leader to limit the fire of his team to a sector of the squad target, to engage a separate target, or to shift to a target of opportunity.

b. Concentrated fire. Concentrated fire is fire delivered from a deployed unit at a single point target. A large volume of fire delivered at the target from different directions, causes the beaten zones of the various weapons to meet and overlap giving maximum coverage of the target. An enemy automatic weapon that has gained fire superiority over an element of a particular unit can often be neutralized by concentrated fire from the remaining elements which are not under direct fire (see Figure 6).

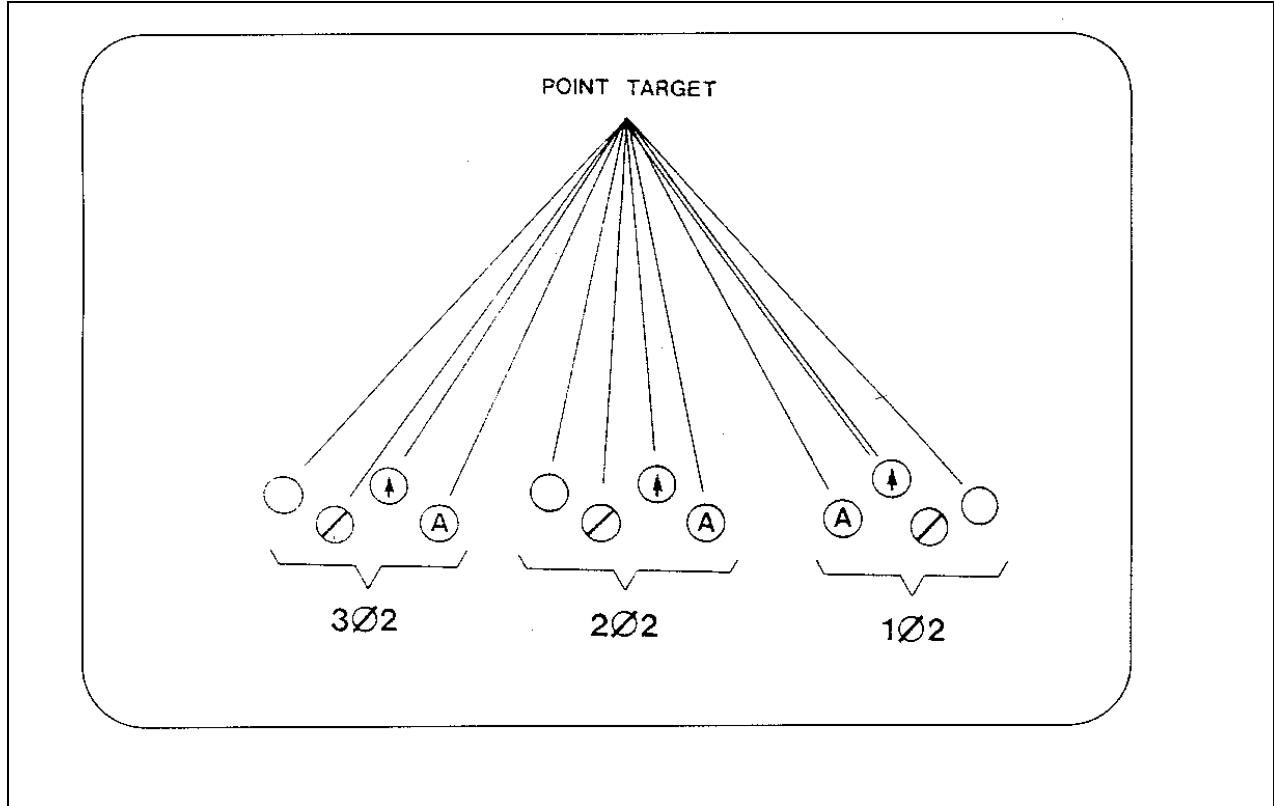


Figure 6. Concentrated fire

c. Distributed fire

(1) Distributed fire is fire spread in width and/or depth to keep all parts of the target under fire. Each rifleman and assistant automatic rifleman fires his first shot on that portion of the target that corresponds to his position in the squad. He then distributes his remaining shots over the remainder of the target, covering that portion of the target on which he can deliver accurate fire without changing his position (see Figure 7).

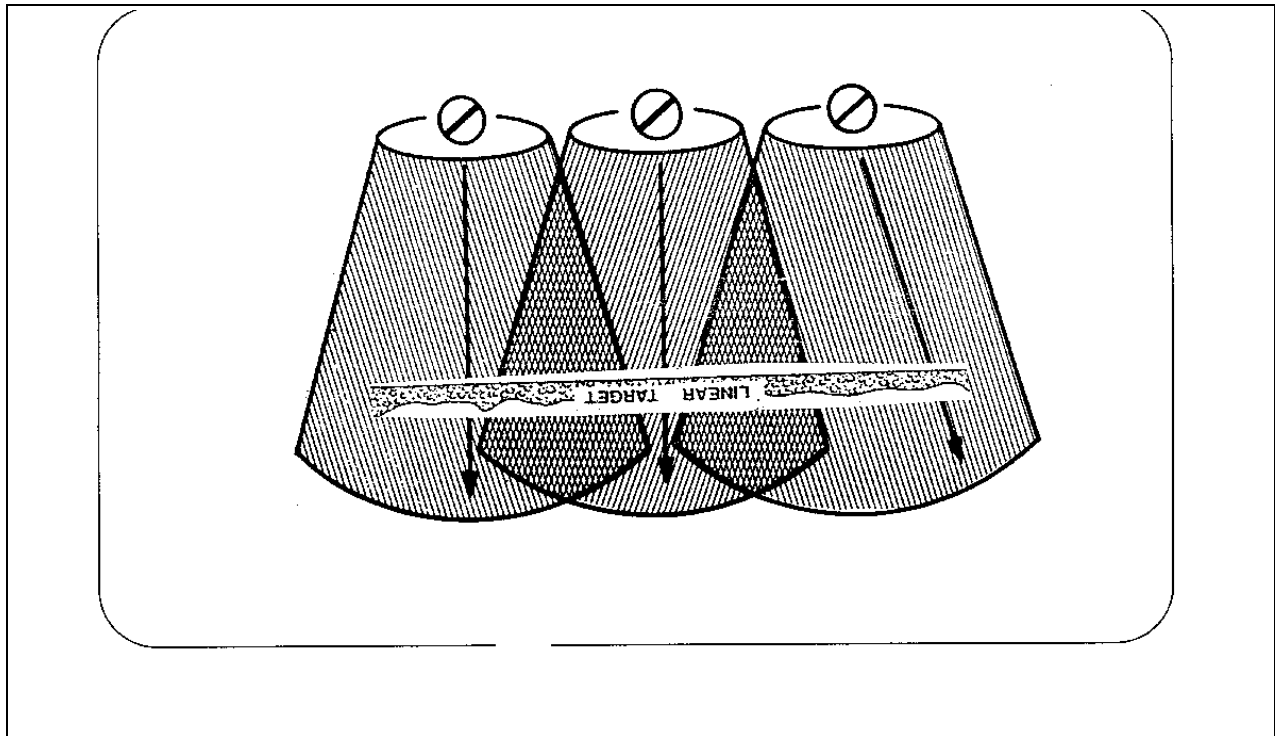


Figure 7. Distributed fire

(2) In the offense, sectors of fire are established, particularly in a support by fire position, to cover an entire target area. In the defense, fireteam sectors must be interlocking and combine to cover the entire squad's frontage.

(3) Distributed fire permits unit leaders to place the fire of their units on target so that the enemy, whether visible or not, is kept under fire. Distributed fire is the quickest and most effective method of ensuring that all parts of the target are brought under fire. When it becomes necessary to engage other targets, the squad leader shifts the fire of one or two fire teams as required.

d. Combination of concentrated and distributed fire. The fire team organization of the Marine rifle squad permits the squad leader to combine both concentrated and distributed fire in engaging two or more targets at the same time. As an example, the squad leader of a squad delivering distributed fire on a target could shift the fire of one or two fire teams to engage a target of opportunity with concentrated fire. Whether a unit (squad or fire team) delivers concentrated or distributed fire is determined by the type of target. If the target indicates a point target (i.e., machine gun, sniper, etc.) the unit will fire concentrated fire. If the target description indicates an area target (i.e., squad in open or dug in, or a target which the squad leader has marked the flanks), the unit will fire distributed fire.

7. **Potential Firepower.** The potential firepower of the 13 man squad with all members firing is conservatively estimated at 400 well-aimed rifle and automatic rifle shots or 370 well-aimed rifle and automatic rifle shots and 15 rounds from the grenade launchers per minute. The following terms are used when discussing application of fire:

- a. Suppress. To degrade the enemies ability to return effective fire.
- b. Neutralize. To render enemy personnel incapable of interfering with a particular operation.
- c. Destroy. To render an enemy combat ineffective.
- d. Support by fire. Fire on an objective that allows a maneuver element to close with the enemy.

8. **Requirements of position.** In occupying a firing position, individuals and units are located to satisfy the following requirements:

- a. Be capable of delivering desired fire support.
- b. Possess good fields of fire to the front.
- c. Have adequate cover and concealment.

- d. Permit fire control by the unit leader.

9. **Range Determination.** One of the most important requirements in bringing effective fire to bear upon an enemy is accurate determination of the range to the enemy. There are a number of methods for determining range, such as:

- a. Estimation by eye

- (1) Mental unit of measure. The Marine must be trained to identify a mental unit of 100 meters on the ground.

- (a) Under 500 meters the mental unit of 100 meters is used to estimate the entire range.

- (b) Over 500 meters the range is mentally divided in half, and the range is estimated to the halfway point and then doubled.

- (2) Appearance of objects. By remembering what people or vehicles look like at different known ranges, you can accurately estimate the range to the enemy when the conditions of the intervening terrain do not permit the use of the mental unit of 100 meters.

- (3) Conditions under which objects will seem nearer

- (a) In bright light.

- (b) When the target contrasts sharply with the background.

- (c) When looking over uniform surfaces like snow or water.

- (d) When looking downward from a hill into a valley.

- (e) When looking over a depression, most of which is hidden.

- (f) In the clear atmosphere of high altitude.

- (g) When looking down a straight open road or a railroad track.

- (4) Conditions under which objects will seem more distant

- (a) When only a small part of the target can be seen.

- (b) When looking over a visible depression.

- (c) When looking upward from low ground.

- (d) When vision is narrowly confined as in a draw or forest trail.

- (e) In poor light - dusk, rainy, snowy, or foggy weather.

- (f) When the target blends with the background.

- (5) Errors of 25 to 40 percent are common among inexperienced estimators.

- b. By observation of fire. The most accurate method of range estimation. Set sights for estimated range; fire and correct from there. The principal disadvantage is the loss of surprise against the enemy.

- (1) Tracers may be used effectively under most conditions. Bright light reflected from snow may render tracer rounds unobservable.

- (2) The terrain must lend itself to the use of ball or AP ammunition in that it must be dry and clear enough to observe the strike of the bullet.

- (3) An observer may be necessary because it is difficult for a rifleman to follow his own tracer and see its impact.

c. Range card method. Another method for determining range is the range card method. A range card is a rough drawing of an individual area of responsibility. It shows the range and direction from the observer's position to easily recognizable objects, terrain features, avenues of approach and possible enemy positions. If practical, pace the distances or refer to a map to rapidly estimate the range to a target appearing in the vicinity of a reference point. Although this method can be used during the offense, its primary application is during the defense (see Figure 8).

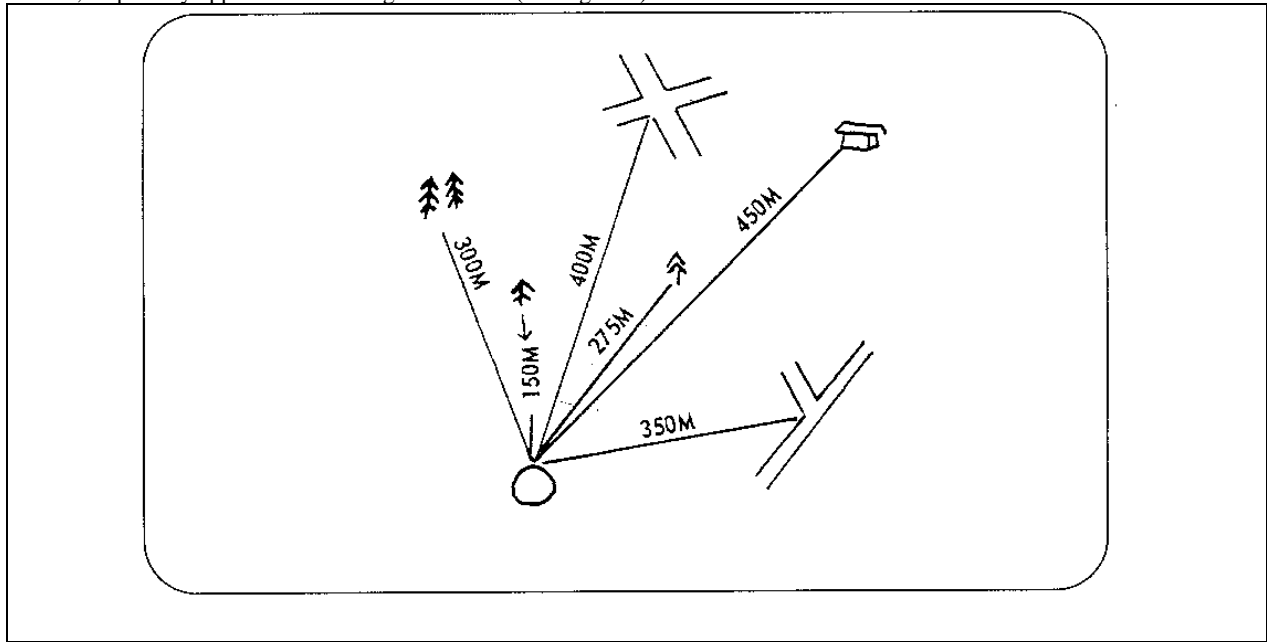


Figure 8

d. Five-degree method. This method utilizes the lensatic compass and a clear line of sight to the target is necessary. This is the most time-consuming method and may expose the observer to the target. To utilize the five-degree method execute the following steps:

- (1) Shoot an azimuth from observer to the target.
- (2) Walk at a 90 degree angle from the azimuth to the target until an azimuth to the target attains a five degree difference.

(3) Once you have a five-degree difference, walk back to the starting point and count the number of steps. Multiply this number by 11 and this will give you the range to the target in meters.

10. **Air Defense.** In the Korean Conflict, the U.S. Air Force lost 544 planes to small arms and machine gun fire. This was almost five times the number lost in all air-to-air combat. In South Vietnam, U.S. forces lost 410 fixed wing and 2100 helicopters to small arms fire. Small arms air defense is a necessary skill for every unit since the successful employment of these tactics will result in a direct decrease of the number of friendly casualties we incur and a proportional increase in the enemy's casualties.

a. Psychological awareness

(1) Expect air attacks and prepare for them by establishing air sentinels and assigning sectors of observation.

(2) Maximize the use of cover and concealment in all movement and position selection in order to avoid being acquired from the air.

b. Early warning

(1) Prior to commencing any operation the unit should be provided the air defense condition for that area. The Air Defense conditions are:

(a) RED: air attack imminent or in progress

(b) YELLOW: air attack probable or likely

(c) WHITE: air attack not likely

(2) Set up a unit signal for air attack/sighting ensuring that it is easily recognizable and passed to all members of the unit.

c. Fight back

(1) The "Hard Kill" is the desired outcome when any aircraft dares to inflict damage on the men who occupy the ground.

(2) If a "Hard Kill" is not obtained, the next best result is to drive the aircraft higher and thereby decrease his accuracy.

(3) In both of the above cases the key to success is the volume of fire or "metal density" of the air. Remember, "UNCOORDINATED FIRES ARE A WASTE OF AMMUNITION."

d. Rules of engagement

(1) Immediately engage all attacking enemy aircraft, helos positively identified as hostile and aircraft you see friendly air defense units engaging.

(2) Engage hostile jet aircraft not attacking your position only after ordered to do so.

(3) Friend or Foe--be SURE before you fire. Drill your Marines on aircraft and vehicle recognition as a matter of routine.

e. Firing back

(1) Aiming point method: The unit leader selects a point ahead of the aircraft and begins to fire as the aircraft approaches, with the rest of the unit joining in on the general deflection and elevation. Remember "metal density" is our goal and not accuracy. SHOOT HIM DOWN OR DRIVE HIM OFF, BUT TAKE POSITIVE ACTION! IF HE'S ALLOWED TO LEAVE WHEN HE WANTS, IT COULD BE VERY BAD FOR YOU! See Figure 9.

<u>Aircraft</u>	<u>Course</u>	<u>Aim Point</u>
Jet	Crossing	2 football fields in front of the nose.
Jet	Overhead	2 football fields in front of the nose.
Jet	Directly at you	Slightly above the nose.
Helo	Crossing	1/2 football field in front of the nose.

Helo	Hovering	Slightly above the helo body.
Helo	Directly at you	Slightly above the helo body.

Figure 9.

(2) **Reference point method:** This method is usually applied in the defense or when a unit is stationary for a brief period of time. The leader selects and points out several Target Reference Points (TRP) and ensures the unit is informed of them. As the aircraft approaches the TRP, he announces the TRP in a fire command and the unit fires on order. Unit members will raise their weapons to approximately a 45 degree angle over the TRP and fire until the aircraft flies through the TRP and then cease fire. See Figure 10.

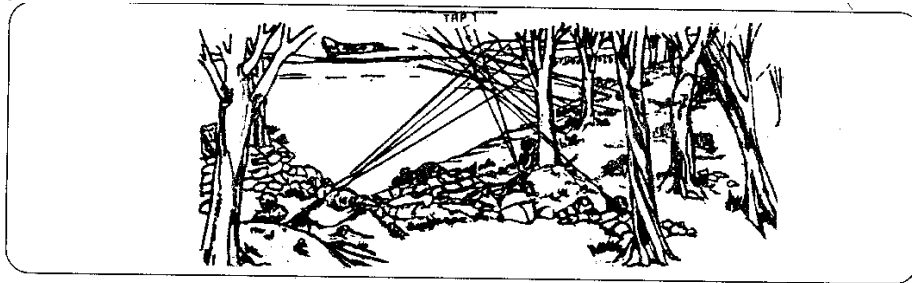


Figure 10

11. Night Firing Techniques

a. Factors that affect night vision

- (1) Dietary deficiencies. Troops who do not have a balanced diet or who are underfed will suffer from poor night vision.
- (2) Exposure to bright light. If bright light enters the eye, night vision is quickly destroyed. This can be avoided to a degree by entering lighted areas with one eye closed to preserve the night vision in that eye.
- (3) Other. Colds, headaches, fatigue, narcotics, tobacco and alcohol impair night vision.

b. Principles of night vision

(1) Dark adaption. This is the power the eye has of adjusting to conditions at and below the level of the moonlight. The eye is constructed primarily for daytime use. The central area contains cones which recognize colors and detail as long as there is sufficient light available. Outside the central area of the retina are areas which contain rods. These rods are sensitive to very small amounts of light but do not recognize color or detail. The rods are the part of the eye we use for night vision. The rods require approximately 30 minutes to warm up and begin to function rather slowly during this time. Once a person becomes adapted to the dark, only an instant of exposure to light is required to regain normal daytime vision.

(2) Off-center vision. Looking straight at an object during darkness is not effective because the cones in the center of the eye only register in good light. Therefore, effective night observation requires the use of off-center vision which employs the use of the rods. Your vision axis must be focused from 6 to 10 degrees to the left or right, over or under the object you are viewing, but your concentration must be kept on the object.

(3) Scanning. Scanning is used in conjunction with off-center vision to bring a fresh set of rods into use so you can continue seeing. A chemical sensitizes the rods for a very short time (4 to 10 seconds); it then bleaches out and other sets of rods must be brought into use. If you do not scan the target area the target object will appear to fade away.

(4) Confidence. When a person practices and applies the first three principles of night vision, confidence will result.

c. Fire control and discipline. When Marine units become engaged in combat at night the same principles of fire control and discipline apply, day or night. There is no substitute for a FIRE COMMAND. Tell the Marine rifleman what to do and he will do it.

d. Night vision devices. Night vision devices such as the Individual Night Vision sight (AN/PVS-4) and the Night Vision Goggles (AN/PVS-5A and AN/PVS-7B) are a valuable asset for the platoon commander. It is possible to utilize these devices to achieve first-round kills at night without resorting to the use of illumination assets.

12. Establishing and Employing Battlesights in the Field

a. Establishing battlesights

(1) Battlesights are defined as a predetermined sight setting that will enable a Marine to engage targets effectively at battle ranges up to 300 meters when conditions do not permit exact sight settings. Establishing battlesights is nothing more than zeroing the rifle for 300 meters.

(2) Depending on firing space available, a unit leader, using the following field expedient techniques, can establish the 300 meter battlesight zero on a rifle at one of two ranges; 33, or if space is available, 300 meters.

Note: For the M16A2, point of aim is the same as point of impact at both 33 and 300 meters.

RANGE	TYPE RIFLE AND TRAJECTORY DATA
33 meters	M16A2 (with elevation set at 300m)
Strike of bullet and point of aim are the same.	
300 meters	Strike of bullet and point of aim are the same.

(3) These techniques are based on the physics of the M16A2 rifle trajectory in relation to the line of sight.

(4) With cardboard from a MRE carton, a "grease" pencil, and 33 meters of space, a platoon commander can quickly and easily establish battle sights on every rifle in his platoon. The result will be a significant increase in both the accuracy of aimed fire and the confidence of each Marine as a marksman.

(5) Battlesights can be set for the SAW in a similar fashion using a 10m range and elevation set at 500m.

b. Employing battlesights

(1) With enemy in view, at any range up to 300 meters, aim for a center point (belt buckle) and the bullet will strike at the center point, or within centimeters of that point.

(2) For ranges over 300 meters using the M16 rifle, retain the battle sight setting on the front sight, but rotate the rear sight elevation scale to the desired range.

(3) In emphasizing battle sights, each Marine must be proficient in range estimation. This proficiency is easily developed using the 100 meter unit measure method, appearance-of-objects method, or the range card method.

13. Offense

a. **Fire and maneuver.** Fire and maneuver is the process whereby elements of a unit establish a base of fire to engage the enemy, while another element maneuvers to an advantageous position from which to close with and destroy or capture the enemy. Supporting fires from weapons not organic to the unit may be provided. Supporting fires should be followed closely by the advancing troops of the maneuver unit so that the shock effect of the fire upon the enemy will not be lost.

b. **Fire and movement.** Once the maneuver element meets enemy opposition and can no longer advance under the cover of the base of fire, it employs fire and movement to continue its forward movement to a position from which it can assault the enemy position. In a maneuvering squad, fire and movement consists of individuals or fire teams providing covering fire while other individuals or fire teams advance toward the enemy or assault the enemy position.

c. When the squad reaches the assault position, the squad leader, fire team leaders and squad members must quickly make final preparations for the assault. Unit leaders issue last minute instructions to their Marines. Squad members armed with the M16A2 to include the fire team leader/grenadier, will ensure they have a full magazine inserted. Riflemen, assistant automatic riflemen and squad leaders should fix bayonets; fire team leaders should load the M203 with the type of ammunition directed by the squad leader. Automatic riflemen ensure that their weapons contain sufficient ammunition for the assault. If the 200 round ammunition box is being used, a quick determination as to the amount of ammunition remaining in the box must be made. If there is less than thirty rounds in the box, reload the weapon with a new box or a magazine. The important thing is not to run out of ammunition during the assault. All members of the squad ensure that hand grenades are within easy reach so they can be used during the upcoming assault.

d. **Rate of fire.** The Marine is trained to fire approximately 10 to 12 aimed shots per minute (average rate). Difficulties encountered in battle usually make a slower rate advisable. The fastest rate at which any rifleman or automatic

rifleman should fire is determined by his ability to select targets, align the sights, and squeeze off accurate shots.

(1) The SAW is particularly valuable against targets such as machine guns and automatic weapons. The rapid rate of fire for the automatic rifle is 200 rounds per minute. The sustained rate of fire is 85 rounds per minute.

(2) Determination of the rate of fire for the SAW is governed by the nature of the target. When beginning a fire fight, the first few rounds of automatic rifle fire should be delivered at the rapid rate in order to gain fire superiority and to fix the enemy. Thereafter, the rate should be slowed to the sustained rate, which is normally sufficient to maintain fire superiority.

e. Support by fire. A support by fire covers and protects the advance of maneuvering units with its fire. Whenever possible, the unit that is to establish the support by fire moves undetected into a firing position. A high volume of surprise fire from an unexpected direction has a much greater physiological and physical effect than fire delivered from a known position. The leader of the unit establishing the support by fire makes every effort to select a position that allows flanking or oblique fire to be delivered into the enemy position. When the support by fire unit is in position, the following usually takes place:

(1) A heavy volume of distributed fire is placed on the enemy position to gain fire superiority.

(2) When fire superiority has been gained and the enemy is fixed in position, the rate of fire is reduced. However, fire superiority must be maintained.

(3) When the maneuver element nears its final coordination line, the rate of fire is increased to cause the enemy to button up tightly, and allow the maneuver element to move out of the assault position and initiate its assault before the enemy has time to react.

(4) When the assaulting maneuver element is in the assault, the SBF is signaled to either cease, shift its fire to another target area, or lead the assault unit across the objective and then ceases or shifts.

f. M203 employment. The fire team leader/grenadier employs the grenade launcher in the offense to destroy groups of enemy personnel and to provide close fire support in the assault in conjunction with, and to supplement, other supporting fires.

(1) The fire team leader personally selects targets and delivers the fires of the grenade launcher during the attack. In the last 35 meters of the assault the fire team leader will stop employing the HEPD projectile so as not to endanger friendly troops. (HEPD rounds require an arming distance of approximately 14-27 meters).

(2) During the assault, the fire team leader/grenadier may employ his rifle until suitable targets appear or until he has time to reload the M203. Suitable M203 targets are enemy automatic rifle positions, machine gun positions, other crew-served weapons within the fire team sector, and troop concentration. This method of employment is used when a heavy volume of fire is needed.

g. M249 SAW. In the offense, the SAW will engage targets depending on the type of target (point, linear, area) that was discussed earlier in the handout.

14. **Defense**

a. Sector of fire. A sector of fire is an area which is required to be covered by fire by an individual, a unit (squad or fire team), or a crew-served weapon. It is a pie-shaped area enclosed by two lateral limits and a forward limit (see Figure 11). Within a rifle platoon, a sector of fire is assigned to individual weapons, fire teams, and squads. Squad leaders are not normally assigned individual sectors of fire since their primary duty during the conduct of the defense is directing and controlling the fires of their units. The sector of fire is used to clearly indicate the area to be covered by fire and to provide for the best distribution of available firepower and complete coverage of the area to the front. It is also employed to ensure mutual support by the overlapping of adjacent sectors of fire. Rifle platoons are assigned battle positions to be defended. The rifle platoon battle position is defended by the overlapping sectors of fire of the squads. The squad sector of fire is covered by the overlapping sectors of fire of the fire teams.

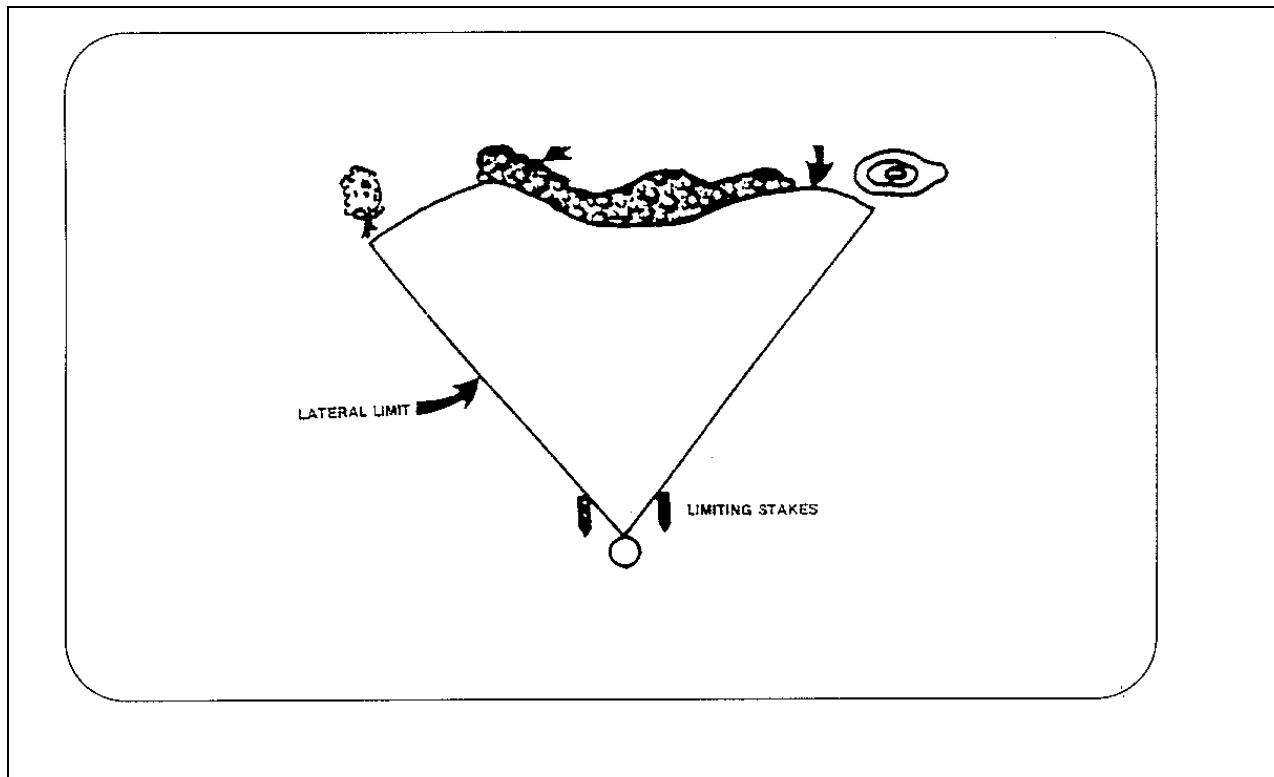


Figure 11. Sector of fire

b. **Principal direction of fire.** The direction of fire assigned or designated as the main direction in which a weapon will be oriented. It is selected based on, the enemy, mission, terrain and weapons capability (FM 101-5-1). Within a rifle squad, a principal direction of fire is assigned to automatic weapons and when applicable, M203s. Units are not assigned principal directions of fire. Riflemen may be assigned principal directions of fire for periods of reduced visibility. Squad leaders and fire team leaders are not assigned a principal direction of fire, nor can an automatic rifle be assigned more than one principal direction of fire. The principal direction of fire is indicated by pointing out a readily identifiable terrain feature. This terrain feature may be the target itself or it may indicate the line of sight when no target is assigned. The limits of the target should be pointed out on the ground when distributed fire is required along the principal direction of fire. Utilizing PDF stakes, which ensures the proper direction and elevation, is a sound technique when employing the SAW or M203 in the defense. These stakes for the M203 should include an elevation stake, recoil stake and a deflection stake. For the SAW it should include a PDF stake (see Figure 12). PDFs are used to:

- (1) Cover dead space in a final protective line of a machine gun. (FPL - a predetermined line along which grazing fire is placed to stop an enemy assault. The fire is usually fixed as to direction and elevation.)
- (2) Cover a specific terrain feature endangering the company or platoon battle position, such as a draw which may serve as an avenue of approach, or hill top which may serve as a possible enemy vantage point. This terrain feature is not necessarily a point on which fixed fire is placed; however, it is intended that coverage of the feature should require little distribution of fire. The principal direction of fire may be anywhere within the sector of fire.
- (3) Protect a crew-served weapon by firing across its front.
- (4) Augment the final protective lines of machine guns placed immediately in front of the battle position.

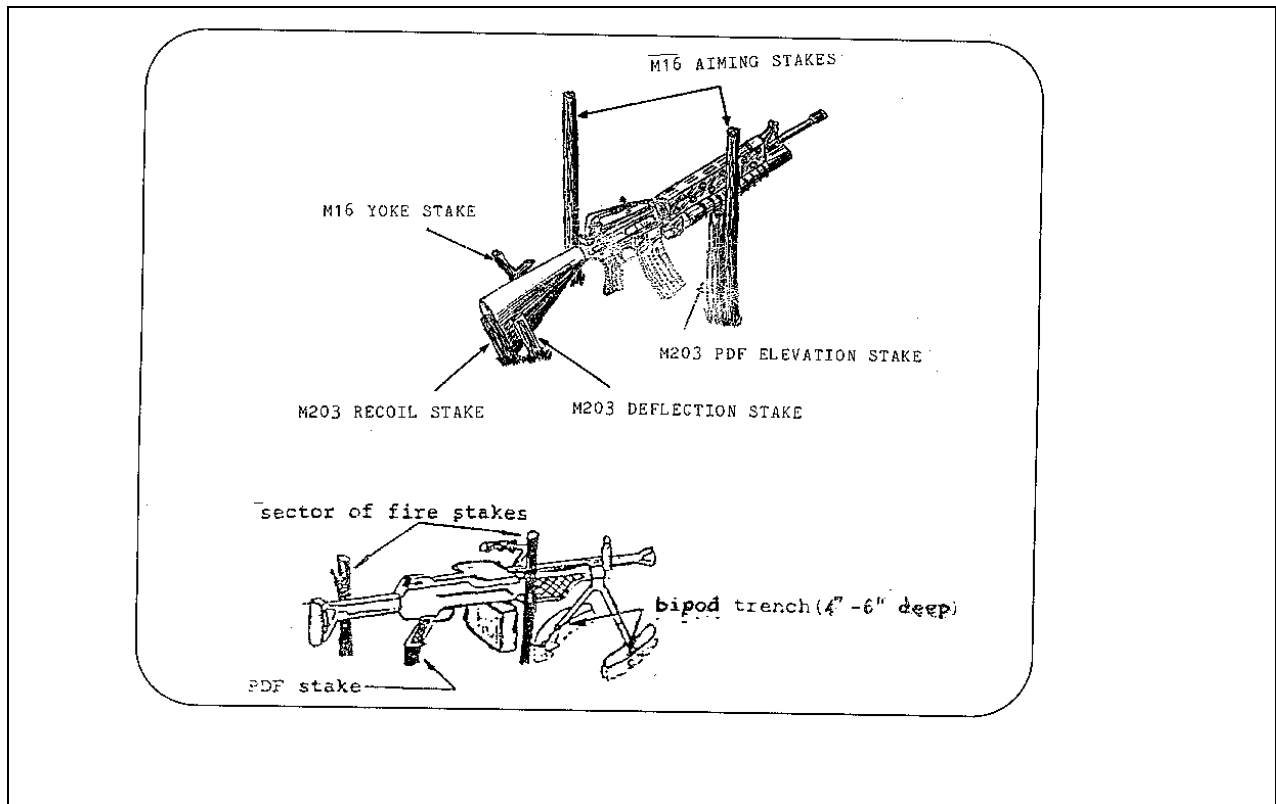


Figure 12. Principal direction of fire

c. **Fire plan.** The fire team leader formulates the team's fire plan to cover the entire sector assigned by the squad leader with the heaviest possible volume of fire (see Figure 13). The fire plan includes assignment of individual sectors of fire, individual fighting positions, firing positions and a principal direction of fire for the automatic rifle as assigned by the squad leader, and the position of the fire team leader.

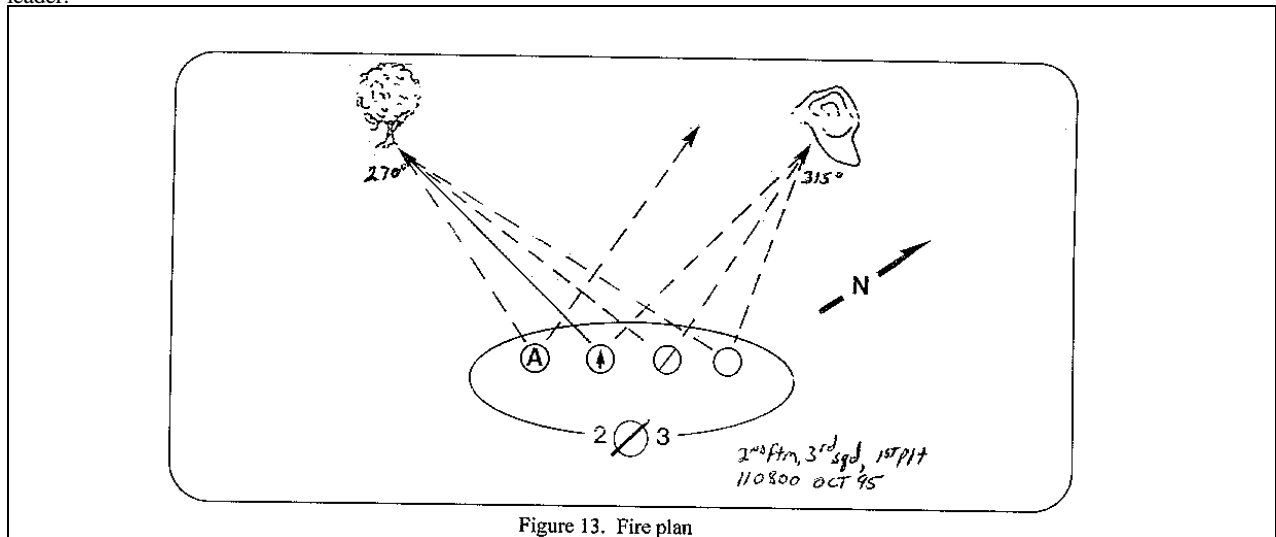


Figure 13. Fire plan

Figure 13. Fire plan

(1) The fire team is the basic fire unit of the rifle platoon and, when practicable, each individual's sector of fire covers the entire fire team sector of fire. The same terrain features are used to indicate the limits.

(2) In the defense, it is impractical for each automatic rifleman to cover the entire squad sector of fire. He is assigned to cover only the fire team sector.

(3) The fire team leader is assigned an individual sector of fire for the employment of the M203 grenade launcher. He covers the entire fire team sector. In addition, he may be assigned a PDF, as discussed earlier.

d. Fire team leader/grenadier

(1) In assigning the sectors of fire for employing his M203 grenade launcher, the fire team leader must consider the overall fire plan. Specifically, he must consider the sectors of fire assigned to the automatic rifleman and the need to furnish support to the automatic rifleman and to adjacent units. The fire team leader then positions himself where he can best control the fire team and deliver the most effective M203 fire.

(2) M203s may be assigned principal directions of fire in order to cover dead space or provide illumination to the unit's front. In some instances the platoon commander or squad leader may assign this PDF. This position may not always be in the center of the fire team's position.

(3) As the enemy approaches the platoon defensive position, he is subjected to an ever-increasing volume of fire from weapons in the defensive position and from supporting arms. Unless restrictions are placed on the firing of the M203, the fire team leaders open fire with the M203 on lucrative targets as they come in range. In some situations, the squad leader or platoon commander may desire to withhold M203 fires until the enemy has reached a specific area, at which time the fire team leader opens fire. The massed surprise fires from the grenade launcher, in conjunction with the fires of the other squad and platoon weapons, can have a devastating effect upon the enemy, particularly in the assault phase of the enemy attack. During final protective fires, the fire team leader engages the largest mass of enemy infantry within his assigned sector with the M203.

(4) The fire team leader's fighting position should enable him to cover the entire fire team sector of fire. Primary and supplementary fighting positions may be assigned by higher. Firing positions are selected to provide maximum cover and concealment consistent with the assigned mission. Extreme care must be taken to ensure that fields of fire are cleared of obstructions which might cause premature detonation of the projectile, thereby endangering friendly personnel. The M203 is employed to cover the most likely avenues of approach for enemy infantry into the defensive position.

e. Automatic rifles

(1) The platoon commander designates the general fighting positions and principal directions of fire for specific automatic rifles.

(2) Since the automatic rifles are the backbone of the squad's defense, the squad leader selects the exact fighting position for the automatic rifle. The remainder of the fire team is then positioned around it.

(3) The platoon commander will indicate the principal direction of fire for the automatic rifle. This principal direction of fire, if not designated by the platoon commander, should be assigned by the squad leader.

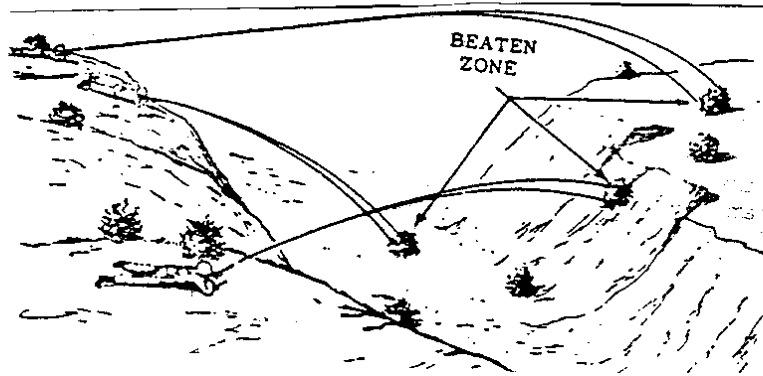
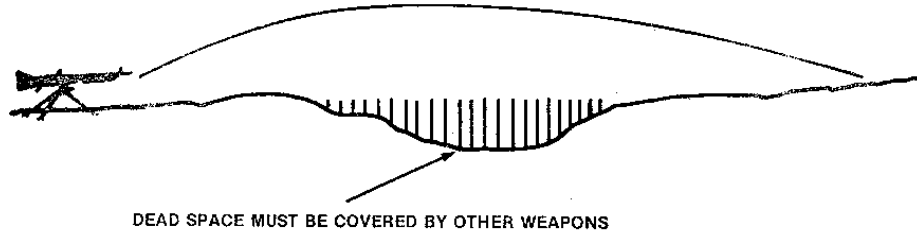
f. Rifleman. The rifleman is positioned so he can cover the entire fire team sector, if possible. His position must provide support and protection for the automatic rifleman.

g. Assistant automatic rifleman. Normally, the assistant automatic rifleman participates in the defense as a rifleman. He is positioned near or with the automatic rifleman because he must be prepared to assume the duties of the automatic rifleman.

h. Opening fire and fire control. The squad withholds its fire on approaching enemy troops until they come within effective small arms range of the squad's fighting position. Squad members open fire on the approaching enemy on command of the squad leader, or when the enemy reaches a predetermined line, normally the forward limit of the fire team sector of fire. When the squad opens fire, rifles are fired at the average rate. When the enemy enters the range of the M203, the fire team leader delivers grenade launcher fire at the average rate. Automatic weapons normally fire at the sustained rate. The squad leader determines the appropriate rate of fire for the situation. Automatic riflemen are usually assigned target precedence to include, but not limited to, enemy automatic weapons, rocket launchers, and other crew-served weapons. Once the squad opens fire, direct control passes to the fire team leaders. The fire team leaders, in accordance with the squad leader's previous plan, designate new targets, change rates of fire when necessary, and give the order to cease fire when the attack is defeated. The goal of the squad is to defeat the enemy attack as far forward of the squad fighting position as possible. If the enemy is not stopped and he continues to close on the squad fighting position, the automatic riflemen will continue to increase their rate of fire as the enemy comes closer.

i. Final protective fires. If the enemy's attack is not broken and he begins his assault, final protective fires are called. Final protective fires are the final attempt to stop the enemy assault before he reaches the platoon's defensive position. When final protective fires are called for, all squad members fire in their assigned sectors (normally the fire team's sector of fire). Rifles and M203s commence firing at the sustained rate; the automatic riflemen will increase their volume of fire to the rapid rate, if they have not yet reached this rate prior to the calling for final protective fires. Riflemen engage enemy personnel within the fire team sector; fire team leaders fire the M203 at the largest concentration of enemy personnel within the fire team sector. Normally, the largest concentrations will be along the PDFs of the automatic rifles.

SUMMARY. Knowing your weapon systems and how to employ them is one of the first steps to becoming technically proficient. A great deal that is taught in this introductory class will be built upon throughout the program of instruction. You must ensure you know the material and understand the concepts prior to continuing on with weapons employment and tactics.



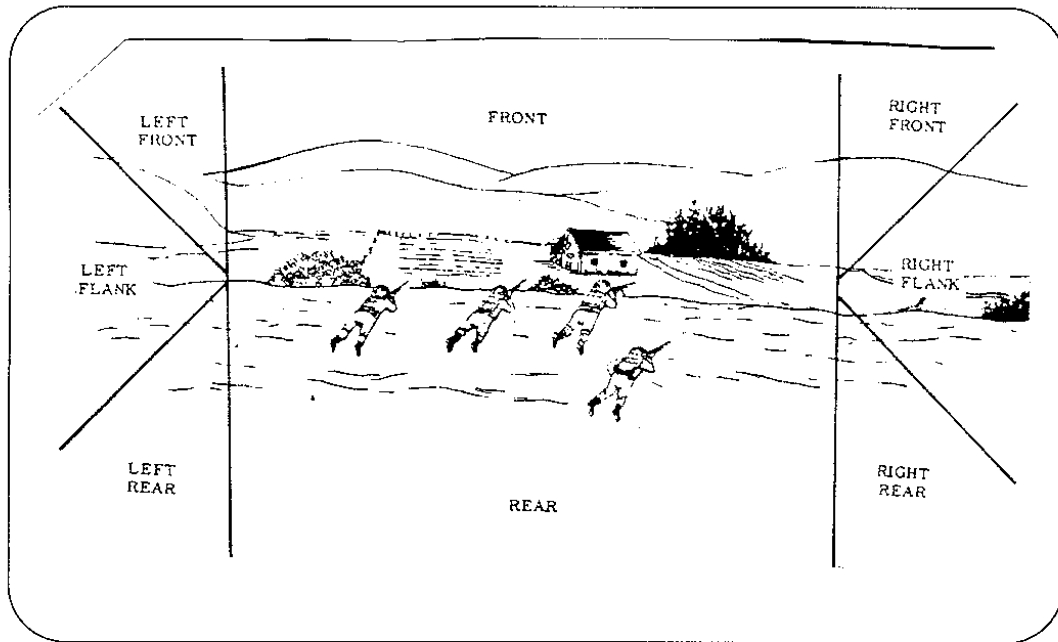


Figure 5